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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/829,021

04/20/2004

Pierre F. Indermuhle

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EXAMINER

KINGAN, TIMOTHY G

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

10/02/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/829,021	<b>Applicant(s)</b> INDERMUHLE ET AL.	
	<b>Examiner</b> TIMOTHY G. KINGAN	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 and 23-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13-16 and 23-26 is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/28/2005</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. No prior art of record has been found teaching or fairly suggesting a slide member of a microfluidic device adapted to slide through an opening formed by wall members defining channels.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by B. Weigl et al., WO 98/43066 (herein after Weigl '739; examiner relies on U.S. equivalent for citations, U.S. Patent 6,159,739).

For Claim 1, Weigl teaches devices comprising microfabricated flow channels (Fig. 3A, **9**), the walls of which may be parallel (Fig. 7D) (spaced wall members), and the ends of which include (define) beveled openings (Fig. 3A, 3B, the top and bottom horizontal walls of 11, **21, 31**) (structures defining an opening).

For Claims 2-3, Weigl '739 teaches the channel ends in an opening, the walls of which comprise trapezoids (beveled structures) (Fig. 3A; note in this cross-sectional view, the walls of the channel are continuous with the trapezoids defining the opening), the trapezoids comprising inward bevels coming to an apex.

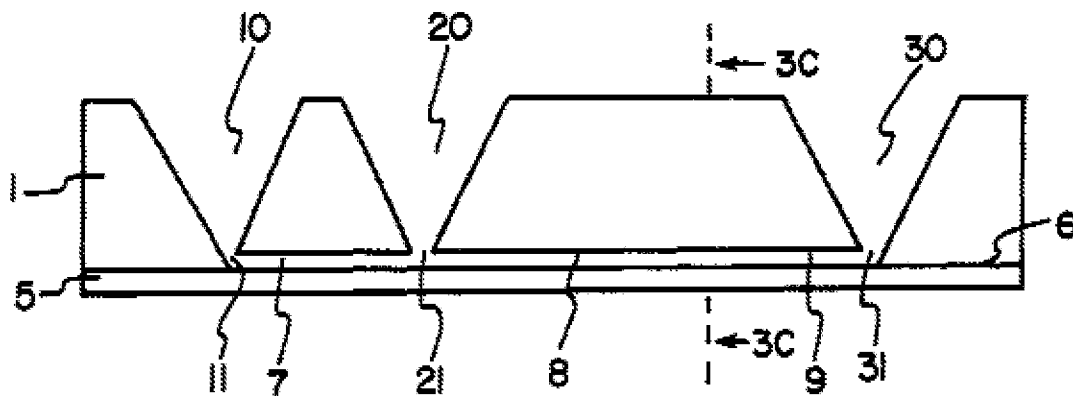


Figure 3A

For Claims 8-10, Weigl '739 teaches flow channels (fluid channels) in a microfabricated device that provide for laminar fluid flow (abstract; col 7, lines 41-43, Fig. 8A) (laminar flow profile), such device comprising a cover plate (abstract) and the wall members forming a slot (Fig. 3A, 3B, 11, 31).

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 4-5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weigl.

Weigl '739 does not specifically teach an angle formed by the tapering wall surfaces, but illustrates an angle of 45 degrees or less (Fig. 3A). It would have been obvious to one of ordinary skill in the art the time of invention to optimize such angles to accommodate a volume of fluid at inlet and/or outlet characteristic of the experiment or to match fluid output to widths of channels running opposite such openings; further, such angles would have been an obvious matter of design choice, since applicant has not disclosed that specific angles of tapers or curved surfaces in such tapers solve any stated problem or is for a particular purpose.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weigl '739 as applied to claim 1 above, and further in view of C. Kennedy, U.S. Patent 6,074,725 (herein after Kennedy).

For Claim 6, Weigl '739 does not teach a distance for the pair of structures defining the opening. It would have been obvious to one of ordinary skill in the art that the values for such distances would arise from the process of optimizing the widths and

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depths of the channels as well as the angles of the tapered/beveled wall surfaces, since the distance would change between the base and apex of the tapered opening together with the optimized angles. Further, Kennedy teaches that the width (and depth) of channels can be optimized to reduce turbulence and hydrodynamic effects (col 2, lines 53-56 and col 5, lines 17-19), and it would have been obvious to one of ordinary skill in the art from the teachings of Kennedy that such optimization would partially determine the distance between the structures defining an opening.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weigl as applied to claim 1 above, and further in view of B. Weigl et al., U.S. Patent 6,171,865 (herein after Weigl '865).

For Claim 7, Weigl '739 does not teach parallel wall members. Such parallel wall members are known in the art; Weigl '865 teaches microfluidic devices with parallel channels (Fig. 4a, col 26, lines 34-38) which are defined by parallel wall members. It would have been obvious to one of ordinary skill in the art to use the parallel wall members of Weigl '865 and their defined parallel channels in order to provide for multiple analyses of a single sample, a single analysis of multiple samples or for multiple reference or control fluids in calibration of an analysis of a single sample.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Weigl '739 as applied to claim 1 above, and further in view of A.R. Kopf-Sill, U.S. Patent 6,524,790 (herein after Kopf-Sill).

For Claim 12, Weigl '739 is silent on use of probes between wall members (within channels). Kopf-Sill teaches microfluidic devices and use of a conductivity probe in the channel of such device (col 16, lines 45-50). It would have been obvious to one of ordinary skill in the art to use a probe inserted between the wall members (within the channel) in order to provide a means of detecting the presence of a sample or reagent in a channel or detecting, with or without quantitation, a reaction product.

***Allowable Subject Matter***

1. Claims 13-16 and 23-26 are allowed. The following is a statement of reasons for the indication of allowable subject matter: No prior art of record has been found teaching or fairly suggesting a microfluidic device or an analytical assembly comprising a microfluidic device with a plurality of wall members/fluid channels wherein wall members comprise opposed beveled structures.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMOTHY G. KINGAN whose telephone number is (571)270-3720. The examiner can normally be reached on Monday-Friday, 8:30 A.M. to 5:00 P.M., E.S.T..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571 272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TGK

/Jill Warden/  
Supervisory Patent Examiner, Art Unit 1797



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